

WHAT IS CLAIMED IS:

1. A process for producing an electrophotographic photosensitive member having a layer formed of a non-single-crystal material; the  
5 process comprising the steps of:

as a first step, placing a cylindrical substrate having a conductive surface, in a first film-forming chamber having an evacuation means and a source gas feed means and capable of being made vacuum-airtight,  
10 and decomposing a source gas by means of a high-frequency power to deposit on the cylindrical substrate a first layer formed of a non-single-crystal material;

as a second step, taking out of the first  
15 film-forming chamber the cylindrical substrate on which the first layer has been deposited; and

as a third step, placing the cylindrical substrate on which the first layer has been deposited, in a second film-forming chamber having an evacuation  
20 means and a source gas feed means and capable of being made vacuum-airtight, and decomposing a source gas by means of a high-frequency power to deposit on the first layer a second layer comprising an upper-part blocking layer formed of a  
25 non-single-crystal material.

2. The electrophotographic photosensitive member

production process according to claim 1, wherein said first layer is made of a non-single-crystal material with silicon atoms as a matrix and containing at least one of hydrogen atoms and halogen atoms.

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3. The electrophotographic photosensitive member production process according to claim 1, wherein the step of depositing said first layer comprises depositing a silicon carbide layer formed of a non-single-crystal material containing at least carbon and silicon.

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4. The electrophotographic photosensitive member production process according to claim 3, wherein said silicon carbide layer is incorporated with an element belonging to Group 13 or Group 15 of the periodic table.

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5. The electrophotographic photosensitive member production process according to claim 4, wherein said element belonging to Group 13 or Group 15 of the periodic table is incorporated in said silicon carbide layer in a content of from 100 atomic ppm or more to 30,000 atomic ppm or less.

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6. The electrophotographic photosensitive member production process according to claim 1, wherein said

upper-part blocking layer comprises a non-single-crystal material composed chiefly of silicon atoms and containing at least one of carbon atoms, oxygen atoms and nitrogen atoms.

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7. The electrophotographic photosensitive member production process according to claim 6, wherein said upper-part blocking layer comprises a non-single-crystal material which further contains  
10 atoms capable of controlling conductivity.

8. The electrophotographic photosensitive member production process according to claim 7, wherein said atoms capable of controlling conductivity which are  
15 contained in said upper-part blocking layer comprises an element belonging to Group 13 or Group 15 of the periodic table.

9. The electrophotographic photosensitive member production process according to claim 8, wherein said  
20 element belonging to Group 13 or Group 15 of the periodic table is incorporated in said upper-part blocking layer in a content of from 100 atomic ppm or more to 30,000 atomic ppm or less.

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10. The electrophotographic photosensitive member production process according to claim 1,

wherein said upper-part blocking layer is so formed  
that said upper-part blocking layer is in a thickness  
of at least  $10^{-4}$  times a diameter of the largest  
spherical protuberance among spherical protuberances  
5 present on the surface of an unfinished  
electrophotographic photosensitive member after the  
second layer has been deposited, and in a thickness  
of 1  $\mu\text{m}$  or less.

10           11. The electrophotographic photosensitive  
member production process according to claim 1,  
wherein, in said second step, the cylindrical  
substrate on which the first layer has been deposited  
is taken out of said first film-forming chamber as it  
15 stands kept in vacuum.

          12. The electrophotographic photosensitive  
member production process according to claim 1,  
wherein, in said second step, the cylindrical  
20 substrate on which the first layer has been deposited  
is first taken out of said first film-forming chamber  
and then exposed to a gas containing oxygen and water  
vapor.

25           13. The electrophotographic photosensitive  
member production process according to claim 12,  
wherein said gas containing oxygen and water vapor is

the atmosphere.

14. The electrophotographic photosensitive member production process according to claim 1,  
5 wherein said third step comprises the step of further depositing a surface layer on said upper-part blocking layer.

15. The electrophotographic photosensitive  
10 member production process according to claim 14, wherein said surface layer comprises a non-single-crystal material composed chiefly of silicon atoms and containing at least one of carbon atoms, oxygen atoms and nitrogen atoms.

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16. The electrophotographic photosensitive member production process according to claim 14, wherein said surface layer comprises a non-single-crystal material composed chiefly of  
20 carbon atoms.

17. The electrophotographic photosensitive member production process according to claim 1, wherein said first film-forming chamber is of a  
25 plasma-assisted CVD system employing a VHF band in high-frequency power.

18. The electrophotographic photosensitive member production process according to claim 1, wherein said second film-forming chamber is of a plasma-assisted CVD system employing an RF band in high-frequency power.

19. The electrophotographic photosensitive member production process according to claim 1, wherein at least a first region of a photoconductive layer is deposited as said first layer, and at least a second region of the photoconductive layer and said upper-part blocking layer are deposited as said second layer.

20. The electrophotographic photosensitive member production process according to claim 1, wherein said second step further comprises a step of working the surface of said first layer.

21. The electrophotographic photosensitive member production process according to claim 20, wherein said step of working the surface of said first layer is a step of removing at least hill portions of protuberances present on the surface of the first layer having been deposited in said first step.

22. The electrophotographic photosensitive member production process according to claim 20, wherein said step of working the surface of said first layer is a step of polishing.

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23. The electrophotographic photosensitive member production process according to claim 22, wherein said polishing is to polish the protuberances present on the surface of the first layer having been deposited in said first step, to make the surface flat.

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24. The electrophotographic photosensitive member production process according to claim 22, wherein said polishing is carried out by bringing a polishing tape into contact with the surface of said first layer having been deposited in said first step, by means of an elastic rubber roller, providing a relative difference in speed between a rotational-movement speed of the first-layer surface rotationally moved together with said cylindrical substrate and a rotational-movement speed of the elastic rubber roller which brings the polishing tape into contact with that surface.

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25. The electrophotographic photosensitive member production process according to claim 22,

wherein said polishing is so applied as to work the outermost surface of said first layer to have an arithmetic mean roughness Ra measured in a visual field of  $10\text{ }\mu\text{m} \times 10\text{ }\mu\text{m}$  of 25 nm or less.

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26. The electrophotographic photosensitive member production process according to claim 20, wherein the step of working the surface of said first layer is a step of plasma etching.

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27. The electrophotographic photosensitive member production process according to claim 16, wherein the step of depositing said surface layer is carried out in a third film-forming chamber having an evacuation means and a source gas feed means and capable of being made vacuum-airtight.

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28. The electrophotographic photosensitive member production process according to claim 1, wherein, in said second step, an unfinished photosensitive member with said first layer deposited thereon is subjected to inspection.

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29. The electrophotographic photosensitive member production process according to claim 1, wherein, in said second step, before said third step is carried out, the surface of said first layer is

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brought into contact with water to carry out cleaning.

30. An electrophotographic photosensitive member produced by the process according to claim 1.

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31. An electrophotographic apparatus which makes use of the electrophotographic photosensitive member according to claim 30.

10 32. An electrophotographic photosensitive member comprising:

a cylindrical substrate having a conductive surface;

15 a first layer comprising a photoconductive layer; and

a second layer comprising an upper-part blocking layer formed of a non-single-crystal material composed chiefly of silicon atoms and containing an element belonging to Group 13 or Group 15 of the periodic table;

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said first layer being a layer from which hill portions of spherical protuberances present on its surface have been removed.

25 33. An electrophotographic photosensitive member according to claim 32, wherein said upper-part blocking layer is in a thickness of at least  $10^{-4}$

times a diameter of the largest spherical protuberance among protuberances present on the surface of said first layer, and in a thickness of 1  $\mu\text{m}$  or less.

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34. An electrophotographic photosensitive member according to claim 32, wherein said first layer comprises a lower-part blocking layer formed of a non-single-crystal material composed chiefly of silicon atoms and containing an element belonging to Group 13 or Group 15 of the periodic table.

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35. An electrophotographic photosensitive member according to claim 32, wherein said second layer comprises a surface layer formed of a non-single-crystal silicon carbide or a surface layer formed of a non-single-crystal carbon.

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